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1879, p. 546 [*Remedios, Colombia*]. — RIDGW. Proc. U. S. Nat. Mus. IV, 1881, p. 201 (part); *ibid.*, VI, 1883, p. 409 (note); *ibid.*, X, 1887, p. 111.

Aramides (Laterallus) albigularis G. R. GRAY, Hand-List Bds. 1871, p. 61, no. 10,442 (part).

Creciscus albigularis SHARPE, Cat. Bds. B. M. XXIII, 1894, p. 140 (part).

Porzana cinereiceps Lawr.

Corethrura albigularis SCL. & SALV. P. Z. S. 1864, p. 372 (part).

Porzana albigularis SCL. & SALV. P. Z. S. 1867, p. 280 [*Bluefields River, Nic.*]; Ex. Orn. 1868, p. 109 (part); P. Z. S. 1868, p. 454 (part). — LAWR. Ann. Lyc. N. Y. 1868, p. 142 [*Gulf Nicoya, C. R.*]. — SCL. & SALV. N. Av. Neotrop. 1873, p. 140 (part). — RIDGW. Proc. U. S. Nat. Mus. IV, 1881, p. 201 (part). — ZELEDON, Proc. U. S. Nat. Mus. VIII, 1885, p. 114; An. Mus. Nac. C. R. I, 1887, p. 131.

Aramides (Laterallus) albigularis G. R. GRAY, Hand-List Bds. 1871, p. 61, no. 10,442 (part).

Creciscus albigularis SHARPE, Cat. Bds. B. M. XXIII, 1894, p. 140, (part).

Porzana cinereiceps LAWR. Ann. Lyc. N. Y. XI, 1875, p. 90 [*Talamanca, C. R.*]. — RIDGW. Proc. U. S. Nat. Mus. I, 1878, p. 252; *ibid.*, VI, 1883, p. 409; *ibid.*, X, 1887, p. 111. — ZELEDON, Proc. U. S. Nat. Mus. VIII, 1885, p. 114; An. Mus. Nac. C. R. I, 1887, p. 131 [*Pacuare, C. R.*]. — RICHM. Proc. U. S. Nat. Mus. XVI, 1893, p. 528 [*Rio Frio, C. R.*; *Greytown, and Escondido R., Nic.*].

Creciscus cinereiceps SHARPE, Cat. Bds. B. M. XXIII, 1894, p. 141 (note), p. 337.

Porzana leucogastra RIDGW. Proc. U. S. Nat. Mus. VI, 1883, p. 408 [*Los Sábalos, Nic.*]; *ibid.*, X, 1887, p. 111.

Creciscus leucogaster SHARPE, Cat. Bds. B. M. XXIII, 1894, p. 140 (note).

Porzana alfari RIDGW. Proc. U. S. Nat. Mus. X, 1887, p. 111 [*Las Trojas, C. R.*]. — ZELEDON, An. Mus. Nac. C. R. I, 1887, p. 131.

Creciscus alfara SHARPE, Cat. Bds. B. M. XXIII, 1894, p. 141 (note).

THE TERNS OF MUSKEGET ISLAND, MASSACHUSETTS.

BY GEORGE H. MACKAY.

MUSKEGET ISLAND lies south of Cape Cod, and is situated in the southern portion of Nantucket Sound. It is about five miles southeast of Martha's Vineyard, and forms the westernmost of the

group of which Nantucket and Tuckernuck are a part. Its first recorded transfer that I am aware of, subsequent to the original deed of Lord Sterling in 1641, to Thomas Mayhew and his son Thomas, is in an old deed dated July 20, 1692, wherein it is described as "Mooskei-a-kit, the westernmost of the islands commonly called Sturgeon Islands," and conveyed by Matthew Mayhew of Martha's Vineyard to six men. These, on February 20, 1693, deeded one-seventh to still another, making him an equal partner, he having originally joined them in the purchase, but his name does not appear in the deed from Mayhew. Each had equal undivided rights in the whole island. This undivided condition exists up to the present time. Two hundred years has, however, so obliterated its ownership that the recorded evidence of title at this time only shows three twenty-eighths. Two of these are the property of a certain shooting club, the other belongs to the writer.

The island is scarcely more than a large sand shoal, portions of which are annually changing, owing to the action of the ocean, which some years ago severed it in two places on the south and west sides, thus forming two other small islands (Adams and South Point Island or Shoal) in addition to the present main island called Muskeget. These all come under the head of and are a part of Muskeget Island. The adjacent waters are very shallow, in a portion of which the eel-grass (*Zostera marina*) grows abundantly, where the pipe fish (*Siphonostoma fuscum*) makes its habitat, and on which the Terns depend to a considerable extent for food. According to Prof. N. S. Shaler (Geology of Nantucket) Muskeget Island is a postglacial deposit, being composed entirely of sand. Consequently there is but little verdure, running ivy (*Rhus radicans*) and sand reed or beach grass (*Ammophila arundinacea*) predominating. Here and there are clumps of beach plum bushes (*Prunus maritima*), which constitute the loftiest foliage of the island. Mosses and lichens are noticeable, — *Usnea barbata*, *Cladonia rangiferina*, *Cladonia boryi*, and *Cladonia cristatella*.¹

The main island of Muskeget runs east by south and west by north. It is about one mile and a quarter long (not including the

¹ I am indebted to Miss M. E. Carter of the Boston Society of Natural History for the identification of the above.

strip of sand known as South Point), and a little over a quarter of a mile wide at its greatest width, narrowing to a few hundred feet towards the western end. According to local testimony it was formerly of greater extent. Its greatest elevation is apparently not over a dozen feet above the surrounding water. Its surface is wind riven and undulating. There are about a dozen shanties on the main island, and a few on Adams Island, which are used at infrequent intervals by shooting and fishing parties; otherwise it is uninhabited. In close proximity on the south is Gravelly Island, and outside of all on the southwest is the South Beach, which serves as a barrier to the ocean on this side.

As it is of the Terns breeding on these smaller islands (Adams Island excepted), and also on what is now called Muskeget Island proper, that I propose to speak, I have deemed it advisable to particularize them, as I shall later on have occasion to refer to each island separately.

The Terns which frequent and become domiciled in this locality are Wilson's (*Sterna hirundo*), the Roseate (*Sterna dougalli*), Arctic (*Sterna paradisæa*), and a few Least (*Sterna antillarum*). To see them all here on their breeding grounds, the most extensive on this coast, in such countless numbers that estimates of them are vain, together with the thousands of their nests and eggs, cannot fail to create in the mind of the ornithological student a profound and most lasting impression. It is the first two of these species to which I would particularly call attention. Since the earliest recollection, they have been returning year after year to Muskeget to breed, and it is here that I have especially observed them. My attention the present year has been more than usually directed to them from the fact that a vigorous effort had been made by a number of the inhabitants of the adjacent islands, Nantucket and Tuckernuck, especially the latter, to obtain a repeal of the present law for their protection, in order to give these people the right to take the eggs for *food purposes* during the month of June (the breeding period). Having taken an active part with some friends in the birds' defense, the objectionable petition was not granted, and the satisfaction I have taken the past summer in seeing the results amply compensates me for the part I took in the matter; for they have not been so numerous or in so flourishing a condition, nor their eggs so abundant for many years.

As far as I am aware *Sterna hirundo* and *S. dougalli* first make their appearance in Muskeget waters any time after the first week in May, and they are remarkably constant in the time of appearing. In 1892 they arrived on May 10, in flocks of fifty or more, drifting sideways before a heavy southeast rain-storm. In 1893 they arrived on May 8, with light air from the west-northwest and clear weather. Twenty were first observed hovering over South Point, Muskeget Island, very high in the air; about five o'clock P. M. two were observed to come quite low down. The next day they were arriving in considerable numbers, flying high during the day time and settling down after sunset. The weather was clear with a light southwest wind. On the 10th, at sunrise, the Wilson's and Roseate Terns were rising in very large numbers from the northern-middle part of Muskeget proper, the weather being clear with a strong southwest wind. On the 11th they continued to increase; there was a strong southwest gale during the night, dying out in the forenoon. On May 19, 1893, I took a walk over Muskeget proper to ascertain how they were laying, as I also did the next day over Gravelly Island, Mr. John R. Sandsbury, who was charged with seeing that the law is maintained in regard to the birds and eggs, being with me. I did not visit South Point, nor South Point Island. On Muskeget proper we found 238 nests, 9 of which contained one egg each; 121 had two eggs each; 94 three eggs each; 10 four eggs each; and 4 five eggs each. On Gravelly Island we found 145 nests, 5 of which contained one egg each; 59 two eggs each; 74 three eggs each; and 7 contained four each. No nest with five eggs was observed. The birds here were mostly Roseates; those on Muskeget proper were largely Wilson's, with a good many Roseates among them. On Gravelly Island there is an unoccupied house and I found one nest of three eggs within eighteen feet, and another also containing three eggs within fifty-one feet of it. Only eight chicks and two chipped eggs were observed.

As a rule there was no regularity in the way the eggs rested in the nests. Of those containing three eggs the larger percentage seemed to be two eggs with the smaller ends towards the centre of the nest, the other lying crosswise. I found considerable

variation in color, size, shape and markings of the eggs, and I failed to detect any constant feature whereby they could be invariably distinguished.

I visited Muskeget again on July 3, and with a friend walked over the same ground that I did on June 20. I found about eighty-five per cent. of all the eggs hatched, and the chicks running about everywhere. I took from the mouth of a chick, from which it was protruding, a pipe fish (*Siphonostoma fuscum*)¹ four inches long. The bird was still too young to leave the nest. They also eat a kind of sea-worm, round in shape and of irregular diameter, and about four inches in length, resembling an earth-worm. I regret that the only specimen which I saved was destroyed before identification. It was probably "one of the Sipunculoids, *Phascolosoma* sp.?" The old birds remain until incubation is over and the young are able to fly and care for themselves, when some of them leave, others remain in these waters until the middle of October. On October 9, 1893, large numbers were observed resting on the water in detached groups of a dozen to thirty or forty birds, extending from Tuckernuck Shoals to East Chop, Martha's Vineyard. On the 16th the same thing was again noted. They were probably preparing to migrate. At such times they collect on the sand bars and points until a large number are together, when they all rise and continue to circle, going higher and higher until lost to view.

I have heard of but two instances of these Terns being captured here during the winter; namely, on February 20, 1891, Mr. Vinal N. Edwards shot a Wilson's Tern in immature plumage, in Woods Hole harbor, Mass., the only one seen at the time. Again at the same place on January 17, 1894, he shot another, which had been frequenting the harbor for about a week previous. The skin of this bird is now in the U. S. Fish Commission collection, Woods Hole, Mass.; that of the former I think is in the Smithsonian collection, Washington. They are not often seen resting *on* the water, preferring to rest on their breeding ground on the upland or on the sand beaches and bars, or occasionally on

¹ I am indebted to Mr. Samuel Henshaw of the Boston Society of Natural History for the identification.

buoys, stakes, etc. They especially delight to be in the air. Their plumage is immaculate, for they are constantly washing themselves. I have yet to see one with soiled plumage. When fishing they arrest their flight suddenly, and maintaining their poise with repeated movements of the wings, look sharply for their finny prey beneath the surface of the water. When it is perceived, the wings are quickly closed, and with a rapid rush they dart headlong from their elevated position into the water, completely immersing themselves, if the fish is sufficiently deep to render it necessary. They reappear almost immediately with the fish held crosswise in the bill, and with a shake of their feathers continue on their way. Their principal food appears to consist of small fry, as lance, pipe fish, etc.

On May 5 and 6, 1894, the wind was strong southwest, and foggy, clearing on the afternoon of the 7th. The 8th was moderate, with southwest wind and foggy. This morning the Terns were observed for the first time this season to be quite numerous, having arrived during the night. At sunrise on the 9th they were abundant, hovering high up over Muskeget proper. The weather was fine, the wind N. N. W., moderate ; partly cloudy. On the 10th at sunrise there were large numbers, as was evidenced by their rising in flocks of two to three hundred from the middle northern part of Muskeget proper. On the 11th a large number were noticed resting on the sand beach on the north side of the island. On the 19th and 20th they were hovering over the island in *thousands* ; on the latter date a strong easterly gale prevailed, which continued during the next day.

In response to my request Mr. John R. Sandsbury walked over a portion of the breeding grounds on Muskeget proper on the 21st, and discovered three fresh eggs, — the first noted this season, and quite an early date to find them. On the 28th he walked in a direct line from his house to the north shore of the island. On his way he saw 4 nests with three eggs each, 16 nests with two eggs each, and 10 nests with each one egg. On June 2 he repeated the walk taken on May 28th, finding 24 nests with one egg, 25 nests with two eggs, 19 nests with three eggs, 2 nests with four eggs, and 1 nest with five eggs. On the morning of June 15 he again took the same walk, only a little more to the westward,

and found 57 nests of three eggs, 31 nests of two eggs, 19 nests of one egg, and 6 nests with four eggs. He saw two chicks to-day, the *first* noted this season.

On this same afternoon (June 15, 1894), I commenced an exhaustive survey of *all* the breeding grounds. To more fully explain the situation of these on Muskeget Island proper (excepting South Point), permit me to state that there is an ancient shore-line near the centre of the island, which is now nearly one-eighth of a mile from the ocean. I perceived several years ago that all accretions to the main island had been added to the northern side, and on examination also found that there were three other similar and distinct shore-lines between the central one and the ocean. These ridges form the most elevated portion of the island, and run through its entire length. They are composed of whitish sand, bare in many places, but in others covered with a scant growth of beach grass and running ivy. The Wilson's and Roseate Terns have selected these ridges, with their slopes and valleys, for their breeding grounds, all other portions of the main island, with the exception of the South Point, being little used by them for this purpose. It is to this particular section that I allude when describing Mr. Sandsbury's walks, as also in giving the results of my own observations on Muskeget proper, always, however, excepting the South Point, which will be described separately. The results of investigations made on June 15 and 16, 1894, with the aid of Mr. Sandsbury, in discovering the nests, I have tabulated in the following condensed form, giving a summary of the nests and eggs found on those dates in each place visited.

	<i>Nests.</i>	<i>Eggs.</i>	<i>Chicks.</i>	<i>Chipped Eggs.</i>
June 15, 1894, Muskeget Island proper.	363	970	14	4
“ 16, “ South Point, Muskeget Island.	348	943	2	2
“ “ “ South Point Island.	266	703	3	none
“ “ “ Gravelly Island.	268	753	1	none
“ “ “ South Beach.	9	20	none	none
Total,	1254	3389	20	6

Of the above nests on Muskeget Island proper, the birds being mostly Wilson's Terns, with more or less Roseate Terns, 35

contained one egg each, 83 contained two eggs each, 222 contained three eggs each, 12 contained four eggs each, and 11 contained five eggs each. On South Point, Muskeget Island, the birds being Roseates and Wilson's intermingled, 19 nests contained each one egg; 87, two eggs; 224, three eggs; 14, four eggs; 5, five eggs. On South Point Island, the birds being Roseates and Wilson's intermingled, 27 nests contained each one egg; 57, two eggs; 169, three eggs; 10, four eggs, and 3 contained five eggs each. On Gravelly Island, the birds, as far as I was able to determine, being exclusively Roseate Terns, 12 nests contained each one egg; 44, two eggs; 197, three eggs; 13, four eggs; and 2, five eggs. At South Beach, the birds I was able to identify were Roseate and Wilson's Terns. I am not sufficiently certain about the Arctic to say anything definitely, but think they were here also. I did not observe any nest here with one egg, but found 7 nests with two eggs, 2 with three eggs; no nests with either four or five eggs were discovered.

On July 1 and 2, 1894, I again, with Mr. Sandsbury, went over *all* of the above mentioned grounds, and following will be found the summary of the results.

	<i>Nests.</i>	<i>Eggs.</i>	<i>Dead Chicks.</i>
July 1, 1894, Muskeget Island proper.	106	206	182
“ 2, “ South Point, Muskeget Island.	51	99	72
“ “ “ South Point Island.	72	144	33
“ “ “ Gravelly Island.	106	226	20
“ “ “ South Beach.	10	17	none
Total,	345	692	307

Of the above nests on Muskeget Island proper, 38 contained each one egg; 41, two eggs; 24, three eggs; 1 contained four eggs; and 2 contained five eggs each. On South Point, Muskeget Island, 19 nests contained each one egg; 20, each two eggs; 10, three eggs; 2, five eggs; no nest with four eggs was observed. On South Point Island, 24 nests contained each one egg; 29 had each two eggs; 15, each three eggs; and 1 nest contained five eggs. No nest with four eggs was observed. On Gravelly Island, 28 nests contained each one egg; 42 nests contained each two eggs; 31 contained each three eggs; 4 contained each four eggs,

and 1 contained five eggs. On South Beach, 4 nests contained one egg; 5 contained two eggs; 1 contained three eggs. No nests containing four or five eggs respectively were observed.

By a comparison with the former summary it will be seen that 80 per cent. of the June 15 and 16 eggs were hatched by July 1 and 2. The difference in the number of eggs observed in 1893 and 1894 may be accounted for by the fact that I did not visit South Point or South Point Island in the former year; nor was the search so exhaustive as in the latter year. There are also *many more* Terns this year (1894) than in 1893.

I found my impressions of 1893 regarding the manner in which the eggs rested in the nest verified, there being no regularity except as heretofore stated.

In order to arrive at a better identification of the eggs of the Roseate and Wilson's Terns, I gathered a large series (one hundred and fifty) on Gravelly Island, which seemed this year to be exclusively occupied, as far as I could judge, by the Roseate Terns; and I also investigated most carefully the eggs in nearly every nest found on that island. As a rule the eggs of the Roseate Tern have greater cubical contents than those of Wilson's Tern, being longer and tapering gradually to the smaller end. This, however, is not always the case, some being smaller than others, and some taper quite abruptly. Some are covered all over with small, irregular brownish marks, others have very small spots of brownish on a dirty white ground, as also on a coffee-colored ground; some have scarcely any spots on a dull white ground; occasionally one is seen of a greenish ground color; some are splashed all over with large brown spots, others with the spots barely showing through the surface, as it were; occasionally one is seen which is very large at the greater end, tapering suddenly towards the smaller. They are almost invariably well covered all over with irregular marks or spots of brownish color. There are some eggs which have a ring of brown spots blended together around the larger end, somewhat similar to some eggs of *Sterna hirundo*, while on others the brownish spots intermingle at the larger end, thus making it the most prominently marked portion of the egg. I have also noted a few of an oval-round shape. I have one egg which is covered with small, pale purple spots.

They also vary more or less in length. The larger clutches of four and five eggs generally vary in a striking manner, and this holds good in a less degree down to two eggs in a nest. I saw, however, in 1893, and also in 1894, several sets of five eggs each which were very much alike, both in size and color. Therefore, while there are many typical eggs which can be easily recognized, there are others which cannot always be distinguished from the eggs of *Sterna hirundo* or of *S. paradisæa*.

It is hence extremely difficult to absolutely identify all of them as they rest in the nest in such a haunt as I am describing, for aside from the fact of their laying in each other's nests, just before the pedestrian reaches the location where the nests commence he is surrounded by a countless screaming horde of bold assailants, who contest every step as an invasion of their precincts. The alarm is given from bird to bird, until it reaches those at the farthest end, who hasten to lend their vocal aid in driving off their common enemy, thus rendering it impossible to come to any conclusion regarding any particular nest and eggs. I have had Roseates dart down at me, and show every demonstration of anger and solicitude, when I have been examining a Wilson's Tern's nest and eggs, the identification of which I felt sure. I have also had the same experience with Wilson's Tern as the assailant, when I have been busy over a Roseate's nest and eggs. It must not therefore always be assumed that the solicitous bird is the owner. As far as my observation shows, I should say that not only do Roseate and Wilson's Terns lay their eggs indiscriminately at times in each other's nests, but also care for each other's young, and make united battle against intruders. It is for such reasons, and others of a similar character, that prevents me from speaking with greater certainty regarding some of their breeding habits. I am of the opinion that three eggs constitute the full complement for a female, and when more than that number are found in a nest, they have been deposited by more than one bird.

My attention the past two seasons having been attracted to *single* eggs resting on the bare, soft sand, without any semblance of a nest or footprints near them, I was puzzled to know how to account for it, such eggs having an unmistakable appearance of

being deserted. Those found last year in July were of a paler color than those in the nests, and had a bleached look. Those I found this season on June 15 and 16 were normal and did not have the bleached look. One day while sitting in the house on Muskeget, Mrs. Sandsbury, who was outside, called to me to come out. Responding to her call, she informed me that she had just seen a Tern drop an egg in mid air, while flying past within ten yards. As it fell on the hard sand beach it was broken, so I only saw the remains, but the incident served to solve to my satisfaction the riddle of the *single* egg. Mr. Sandsbury then informed me that he also had seen a Tern drop an egg this year as the bird flew past him. I offer the following in explanation. Here is a haunt where immense numbers of Terns are breeding. Out of the number an occasional bird fails to reach her nest in time to deposit her egg. Unable to retain it longer, it is dropped in mid air. Should it happen to fall in soft sand (it is invariably in such places that I have found them), from not too great an elevation, it remains unbroken and becomes bleached by the sun. Eggs which fall on harder ground, or from a greater height, are of course broken. I have one specimen a little indented, with the sand still adhering to the fractured part, where a little of its contents had oozed out. I found about a dozen such eggs on June 15 and 16, 1894, of which I saved six. They are all Roseate's eggs, and of the usual fresh color, undoubtedly having been recently dropped. On breaking one purposely, I found it to be particularly fresh. Those found last year on July 3 and 4 were probably old, and consequently bleached.

I have remarked that all the Terns in this locality construct their nests so that they shall harmonize with the surroundings. Nests placed on the beach are usually constructed of eel-grass (*Zostera marina*) or the eggs rest in a hollow made in the sand, without anything around them. On the higher ground they are composed of beach grass, or little sticks and stalks. To me they show a method in their apparent carelessness. Few of them, however, deserve the name of nest; usually there is little attempt at concealment, and they seem to like to place them in some spot from which there is a good lookout. They are often placed on top of the windrow of eel-grass washed ashore on the beach, close

to the water's edge. As far as I have observed neither the Roseate nor Wilson's Terns alight *on* the nest, but always several yards away from it, and then walk to it. They also walk away from it before flying. The repeated imprints of their little feet upon the sand have many times directed me to their eggs. They are quite active when on the ground, and can be daily seen on the sand, walking about in the vicinity of their nests.

I do not think the Roseate or Wilson's Terns lay as a rule more than one set of eggs. Should they lose them through accident or otherwise, it is probable they would lay again the same season, if not too late.

The eggs of Wilson's Tern are smaller, as a rule, than those of the Roseate, and they are shorter, and more blunt at the smaller end, yet some are not so. They vary in color and markings, as do those of the Roseate, but I think not so much so in size and shape. Some eggs have a coffee-colored ground with irregular brown spots all over the egg; others have them only at the larger end, where often they are merged in a ring, with the rest of the egg without spots or with very few. They do not often have the small irregular brown marks so characteristic of the Roseate's eggs, yet some eggs look so much like some Roseate's as to be with difficulty distinguished from them.

I have not had sufficient experience with the Arctic Terns to write very much regarding them. As far as I know, their habits and food in this locality are the same as those of the Roseate and Wilson's Terns. They are said to breed in small numbers on the South Beach, on the southwest side of Muskeget Island, which, I believe, is their southernmost breeding limit. I have never collected any eggs here that I felt sure were those of this species. They resemble the eggs of Wilson's Tern so closely that it is nearly impossible to distinguish them, and there is a very close resemblance between the birds themselves when flying. I have seen Wilson's Terns with breasts as dark as some Arctics, and the difference in their bills can be seen only at close range. I have seen but few of their identified eggs, and these I was unable to distinguish from those of *S. hirundo*.

When Mr. Sandsbury took up his residence for the season of 1894 on Muskeget Island, on May 4, he noted about one hundred

Least Terns hovering around South Point, Muskeget Island proper. On the arrival of the Roseate's and Wilson's, they seemed to have departed, for they were no longer observed. They are said to be the first Terns to appear here in the spring and to always leave when the other Terns arrive. They do not lay on the uplands in this locality, as do the Wilson's and Roseates, but usually along the beaches. They lay from two to three eggs. On June 16, 1894, one nest containing three eggs was found on the South Point of Muskeget Island. It was placed a few feet from the edge of the low bank, which divided the upland from the beach on the ocean side, at the foot of a bunch of beach grass, and partially concealed. The eggs were not quite half the size of those of the Wilson's Tern, and were nearly equally covered over with very fine brownish spots on a pale buff ground. They are said to breed in small numbers on the sandy point at the southeast end of Tuckernuck Island, and formerly on Smith's Island (now washed away), south of Tuckernuck Island. I am informed by an old resident that they were sometimes called 'Oyts,' from a resemblance of one of their notes to the sound of this word, and that formerly they were much more abundant than at the present time. Not having particularly observed them recently, I cannot speak with confidence in regard to them. I am, however, inclined to regard the nest above mentioned as accidental, it being the first I have known here.

In considering the chicks in the down of *S. hirundo* and *S. dougalli*, I have been somewhat puzzled regarding their identity, and am unable to speak of them with certainty. One has a black throat, white breast and abdomen, the entire upper parts, including the top of the head, being of a pale yellowish gray, intermixed with small irregular black marks; the feet, legs and bill are of a reddish yellow, except the tip of the latter, which is blackish brown. The other chick has the entire upper parts, including the top of the head, of a rather more decided gray than the other, and rather less of the yellowish tinge, with black and brown markings intermixed. The throat is blackish, and the feet, legs and bill are flesh color, with the tip of the latter blackish brown. As this chick advances in age, the upper mandible becomes brownish black, while the lower still retains the

flesh color nearly to the tip, which is brownish black. When a few days old they are somewhat similar in general appearance; both have blackish throats, but the throat of the reddish-legged chick is decidedly blacker than that of the other. As I have often seen the reddish-legged chicks in what I call Roseate's nests, with unhatched Roseate's eggs beside them, and the same day seen a similar chick crouched beneath the breast of a Wilson's Tern, it will be understood why I am not prepared to speak more definitely.

I have frequently heard the chick peep while in the shell prior to its being chipped. At such times the chick is doubled up, with the head between the legs at the larger end of the egg. On carefully breaking open such eggs the chick instantly opened its eyes. I have also watched the process of the chipping of the egg while the chick was endeavoring to release itself. This process is slow and laborious. As soon as a small hole is pierced a little to one side of the larger end of the egg with the bill, which is provided with a little hard white knob at its point, the chick seizes hold of, and bends back and forth, a minute fragment of the shell until it is detached. This effort is continued for only a few seconds at a time, and must be repeated a number of times before the fragment is broken off. The labor seems exhausting, the chick panting while resting after each effort. In a few seconds later the attempt is again renewed, and so on until its release is effected, and a wet little chick appears. As soon as it is able to run it leaves the nest, and its first instinct is to hide. A few blades of grass or a leaf is sufficient for the purpose; provided its head is partially covered it will not move, no matter how closely it is approached.

During this early period of their existence, and while in the nest, they suffer considerably from the attacks of a small, red ant, which is numerous on Muskeget Island proper, including South Point. These ants get on them in numbers, and by an incessant biting and pulling at their wet down, with accompanying worry, cause the death of many of them. I have stated in a previous part of this article the number of dead chicks I found; but they doubtless represent but a part of the whole number. As there had been no inclement weather in the neighborhood since

these chicks were hatched, I am inclined to attribute more or less of this mortality to these ants. My record shows that 307 dead chicks were found on July 1 and 2, 1894.

This year the Terns left this vicinity earlier than usual, large numbers having departed by September 1. Should one desire to see them in all their glory, it would be well to visit them about the first of July and walk out among them at sunrise or at sunset. The former is the better time, for then they are preparing to depart for the 'rips' for food, many of them going long distances. While making a passage to Nantucket I have often observed them when it was nearly dark, when flocks of a few to fifty would be flying close to the water, all headed for Muskeget. It is when among them at their breeding grounds that their wonderful aerial movements can be best observed. Some of them are very bold and fearless, especially the beautiful Roseates, when guarding their eggs or young. The roseate tint on their breasts, so noticeable in the spring, vanishes after death. Beautiful and graceful, who can view them without feelings of admiration and delight? Thick fog does not seem to disturb them, and the local boatmen can usually tell under such conditions how Muskeget Island bears by watching the course of these birds. They also direct the fishermen to where the schools of bluefish are feeding, by hovering over the school, and darting down after the small fish which the bluefish have driven to the surface. Yet these men have but recently sought to appropriate their eggs by wholesale, during their laying period, the result of which would be the breaking up of their haunt, reducing their numbers, and driving them from these waters.

I cannot refrain from describing one Tern's nest containing two eggs which I found on the South Beach, June 16, 1894, as it was different from any I have ever before seen. It was but a hollow in the beach sand, about thirty yards from the water. The floor of this hollow was lined with small, flat stones about half an inch across, and smooth, their upper surfaces being on a level. I examined it critically, in order to ascertain if it were accidental or artificially constructed. My conclusion was that the stones had been brought and placed in position by the owner of the nest. I was careful to examine the immediate surroundings

to see if any such result could possibly be produced by the blowing away of the sand, and decided it would be impossible. I then called up Mr. Sandsbury, who was near at hand, and asked him his opinion without expressing my own; as he agreed with me in every particular I considered the circumstance worth recording. As I knew of no way then of taking it, as it was in place, I left it until my next visit, July 2, when I went after it with the proper appliances to preserve it. This time, however, I failed to find it, the eggs having probably been hatched in the mean time and the loose sand had blown over and covered it up.

Although my remarks have already reached considerable length I would beg to add a few words regarding the colony of Laughing Gulls (*Larus atricilla*) inhabiting Muskeget Island proper (see Auk, Vol. X, p. 333). I visited it on June 15 and July 1, 1894, finding it in the most flourishing condition. Their number had nearly doubled, as nearly as I could judge, since last year. They were nesting a few hundred yards west of where they were last year, on the northern side of the island. On June 15 I found fifteen nests containing forty-one eggs, of which, four nests contained two eggs each, and eleven nests three eggs each. I noted one egg which was pale olive brown, practically unspotted. These nests were in tall beach grass, and placed in the middle of a narrow path or alley, where the grass had been trodden down by the birds in going in and out. They apparently do not turn around to go out the way they enter, the passage being too narrow to permit of it, without disarranging their plumage. All the bare knolls of sand in the immediate vicinity of the colony had been much used by them as resting places. They are extremely gregarious in this breeding haunt, which is not more than one hundred yards in diameter, and their nests are at times placed within a few feet of each other. They are apparently on the best of terms with their neighbors, the Roseate and Wilson's Terns, whose breeding grounds adjoin and encroach on theirs, and with whom they intermingle. When I again visited them on July 1, I found most of the eggs hatched and the young chicks in the grass. I found, however, two nests with one egg each, and six nests with two eggs each. The chicks in the down have the entire upper parts grayish, with a yellowish tinge, intermixed with

black. The top of the head is pale yellowish, irregularly spotted with black; abdomen grayish; throat light reddish yellow; breast whitish. The legs are reddish chocolate, as also the bill at the base, the tip being a pale flesh color, and very blunt, having the appearance of being cut off squarely. While handling one of the chicks from which this description was taken it twice ejected considerable portions of a soft shelled crab. Another nest, containing one egg and two chicks; the chicks were younger than the one above described, and were of a generally darker color. The yellowish tinge of their down was also rather stronger in tone. The red ants had found them out and were troubling them, but they were probably too large and strong to be killed by them. I saw no dead ones. The chicks utter a chirping sound, repeated three times in succession.

The pleasure derived from the many instructive days which I have passed in companionship of these Terns has led me to prepare this contribution to the life history of these beautiful and interesting birds.



A SWALLOW ROOST AT WATERVILLE, MAINE.

BY ABBY F. C. BATES.

NOT FAR from where a small stream, called the Messalonskee, joins the Kennebec River, one may see at evening from the middle of July to about the third week in September, an interesting sight in the bird line.

The willow trees along the banks of this stream, particularly a close row some five or six hundred feet in length, form the roosting place of vast numbers of Swallows. During the forenoon and early afternoon very few Swallows are to be seen in the sky,—indeed they are conspicuous by their absence,—but a little before sunset the birds begin to arrive in the vicinity, flying, sailing, chasing each other around in the upper air, everywhere within eye's reach. From north and south, east and west, in they